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THE WATER SUPPLY OF THE CITY OF QUEBEC¹

BY CHARLES P. CASGRAIN²

The water supply of the City of Quebec is taken from the St. Charles River at Lorette, 7 miles from the city. The catchment basin of the river at this point is about 140 square miles, with a small agricultural population over which a strict sanitary supervision is exercised. The crest of the dam at Lorette is 486 feet above the main river level at Quebec, so that there is ample head for a gravity supply. At the present time the consumption is about 12,000,000 to 15,000,000 imperial gallons daily. By constructing dams on the catchment basin, so as to regulate the flow of the St. Charles River, a daily supply of 30,000,000 to 40,000,000 gallons can be obtained.

The first main from Lorette to Quebec was an 18-inch line laid in 1854. This was paralleled in 1883 by a 30-inch pipe, and six years ago by a 40-inch pipe, so that there are three independent mains to the city. These mains cross the St. Charles and Des Mères Rivers on bridges. The upper levels of the city are supplied entirely by the 40-inch main, which also furnishes water to the lower levels in case of fire.

When the works were built 75 years ago, public fountains were established at different places in the city, and the privilege of selling water at low rates from these fountains was auctioned off annually. These fountains were abandoned many years ago. Today there are about 11,000 private services in the city, and the consumption is about 125 gallons per capita daily.

A small amount of water from other sources is supplied to Montcalm and Jacques Cartier Wards.

In winter the water is perfectly clear, but after the heavy rains of spring and autumn the water contains considerable sediment. This causes very little trouble in operation. The head is so great that by

¹ Revised from an informal talk at the Montreal convention on June 22, 1920. Discussion is invited and should be sent to the Editor.

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opening the blow-off gates and hydrants the mains are flushed clean. The sanitary quality of the supply is excellent and typhoid fever and other water-borne diseases are practically unknown in the city. On account of the small population on the catchment basin, the advantages of chlorination and filtration have been studied, but their adoption has not yet been considered necessary.

From the level of the St. Charles River to the Grande-Allée there is a rise of 366 feet. The pressure in the high-service sections of the city averages about 65 pounds and that in the lower levels about 100 pounds, which can be raised to 125 pounds by adjusting the controlling valves between the different service districts. There are about 800 hydrants and the fire protection service is so good that it is hoped the insurance underwriters will reduce their rates.

The water rates are $\frac{1}{2}$ of 1 per cent of the real value of the property served. There are several religious and charitable institutions which are charged 10 cents or 25 cents per 1000 gallons, and educational institutions are charged 60 cents per 1000 gallons. Next year it is proposed to meter the cold storage, tannery, laundry and other industrial plants using large quantities of water.

The climate of the city causes some operating conditions not experienced in many places. The winters are very cold, and the temperature drops to 30° below zero. If anything happens to the 40-inch main during such weather, there is trouble in the high service district. Last winter there were a few such interruptions of service when the thermometer was reaching 20° to 25° below zero, and during the few hours water stopped flowing in the supply main many services froze. These frozen services were thawed very rapidly, sometimes as many as a hundred in a day, by three electric outfits, with the help of the Quebec Railway, Light and Power Company, which charged \$5 per service. This charge is considered reasonable.

In order to avoid the freezing of services as much as possible the city insists that every new house must have adequate provision for heating the cellar, and is very lenient in the matter of allowing water to run when the temperature is low. In fact, when there are too many complaints of frozen pipes, the consumers are advised to let the water run, for which no charge is made.

At the present time most houses have furnaces or boilers in the cellars, which prevent freezing of the services. Where there is no such heating apparatus and it has been necessary to thaw a service two or three times, the owner is told that he must attend to thawing the service himself until the cellar is heated properly.